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ABSTRACT

A historical perspective is provided of instructional theories, and some comments are presented on five papers from a session of the 1998 annual meeting of the American Educational Research Association (AERA). There is a large array of contemporary instructional design theories and models, and the number of theories is increasing. Some ways of looking at instructional theories in this era of theory proliferation are discussed. Some ideas and issues related to the following session presentations are explored: (1) "Simulated Apprenticeship: The Goal Based Scenario" (Roger C. Shank, Tamara R. Berman, and Kimberli Macpherson); (2) "Learning Communities in Classrooms: A Reconceptualization of Educational Practice" (Katerine Bielaczyc and Allan Collins); (3) "A Design Theory for Classroom Instruction in Self-Regulated Learning" (Lyn Corno and Judy Randi); (4) "Collaborative Group Problem Solving: Learning Together" (Laurie Miller Nelson); and (5) "Structured Design for Attitudinal Instruction" (Thomas F. Kamradt and Elizabeth J. Kamradt). (SLD)

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Historical Perspective, and Critique of Five Instructional Theories

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Session #1: Historical Perspective, and Critique of Five Instructional Theories

(Theory papers, respectively, by Roger C. Shank, et al.; Katerine Bielaczye & Allan Collins; Lyn Corno & Judy Randi; Laurie Miller Nelson; the Cognitive and Technology Group at Vanderbilt: Daniel L. Schwartz, et al.; and Thomas Kamradt & Elizabeth J. Kamradt)

Glenn E. Snelbecker, Ph.D., Temple University

Paper presented at the American Educational Research Association Meeting in San Diego, CA, April, 1998

Note: Following are materials prepared for this paper. Some of the information about the respective theory papers was available prior to the session, while other observations and comments were written while the respective authors presented their theory papers.

What can be said about the theories in today's session [along with those in the two sessions on Friday]? Certainly not enough about their pertinent features in the time available here to "do justice" to the authors' work! Recognizing the time constraints under which these authors and I have to function, I'll offer some observations about the theories collectively, after which I'll identify some ideas and some issues that were stimulated by the theories presented in this session.

This is an impressive array of contemporary instructional design theories and models. Collectively they illustrate both common features and diverse views prevalent today concerning instructional theory and the potential practical application of our evolving knowledge about designing instruction. They also reflect trends of a more general nature (i.e., beyond instructional theory) discussed today in both "education" and "training" contexts. These trends include, for example:

- **contemporary emphases on cognitive processes;**
- **growing recognition about the role of affect in education and training;**
- **questions about how we can effectively conceptualize and address learner characteristics;**
- **apparently somewhat less concern about potential impact of relevant differences among instructors and about instructional delivery system characteristics;**
- **awareness about the potential impact of sociocultural characteristics on the process and outcomes of instruction; and**
- **general agreement about the desirability of improving the effectiveness of instruction, but contrasting views about how this can be done.**

Both during their presentations today -- and even in the greater detail they could provide in their chapters -- we really should consider these statements as "samplers" or executive summaries about work in progress.

Another thought was that these authors, and especially editor Reigeluth, should be commended not only for their respective conceptualizations but also for their willingness to collaborate with each other: Such collaboration takes time away from work on their respective approaches. But it will only be through a combination of individual creative activities and collaborative efforts that we can ultimately gain a fuller, more comprehensive understanding of instruction and learning, as well as to derive better guidelines and insights about how this body of knowledge can enhance learning and instruction in education and training contexts.

The last general suggestion I'll offer here results from some observations about the rapid "growth" in the number of theories within other aspects of psychology, and my projections for generally similar future growth in the number of instructional theories. In brief, I believe that we should expect some substantial acceleration of "growth" in instructional theories that will be available to us during the years ahead -- perhaps as many as 10 times the number of theories now available -- and that there are costs and benefits of this growing fund of information about designing instruction. By my count, Volume 1 (Reigeluth, 1983), which was published fifteen years ago, contained 8 theories, whereas Volume 2 contains 24 theories. This may seem like only a moderate extent of growth in the number of theories over a 15-year period. However, when one takes into account the fact that there are many more theories than were selected for this book, it becomes apparent that we may have problems in learning about so many different theories. Moreover, observations about the rapid growth in the number of theories in other aspects of psychology – notably, psychotherapy theories, and cognitive theories – lead to the prospects that we might find 10 times as many instructional theories within the next 10 years compared with the 24 theories included in Volume 2. This increase in the number of alternative conceptualizations about instruction will both offer us an opportunity to have access to alternative ways for designing instruction, but that this means that we'll have the obligation of learning about an increasingly large amount of information.

Whether or not my projection that we could have an array of over 200 instructional theories within 10 years is accurate, it seems inevitable that there will be a significant increase in the number of instructional theories within the foreseeable future. Thus I suggest that we should consider each theory or model in three ways: (1) What "added value" can be derived from each particular theory? (2) How each particular theory fit in the overall array of instructional theories becoming available? (3) What might we do to enable not only students but also experienced practitioners to know about to use this growing fund of information? I

believe that this is important whether we view ourselves as "knowledge producers" (theorists, researchers), and whether we elect to use one theory or to draw several theories when planning or studying instruction.

Now I will briefly identify (a) some ideas that I gained from the respective theories, and (b) some issues detected while reading a particular theory but which are relevant for instructional theories more generally.

- Presentation #1, Session #1
- Chapter 9 Roger C. Shank, Tamara R. Berman, & Kimberli A. Macpherson, Simulated Apprenticeship: The Goal Based Scenario {Learning By Doing}
  - Concern about "fact-based knowledge" instead of higher cognitive levels
  - Problems inherent in traditional instruction
    - (1) "know that" format – involves imparting factual knowledge; children are not learning skills
      - GBS teaches "how to" rather than only "know that"
    - (2) "students are not given the opportunity to pursue new knowledge in service of achieving intrinsically motivating goals" – learn facts, or even skills, in some cases, for the purpose of finishing a set of homework problems or in order to pass a test.
    - (3) children are learning in a decontextualized fashion
  - Trying to apply some lessons learned about how people learn and how human memory works, partly based on development of intelligent computers
  - CBR (case-based reasoning) – their theory of memory and learning
    - P. 3: "Case-based reasoning (CBR) is our theory of how we remember, and how we use our memories in order to solve new problems. We use CBR regularly in daily life; it constitutes how we learn from the time we are infants through our adult existence."
    - P. 3: "When you bake anything, you have an image of how you would like it to turn out. In the end, either it does or does not turn out

      p. 4: the way you planned. ... You are learning from you prior experiences, or case-based reasoning. ... Case-based reasoning is an effective way to learn or improve any skill. CBR is, generally, how people become experts, and how experts often reason about problems in their domains of expertise (Schank & Riesbeck, 1989)." [[Not in the reference ... unless authors were reversed in order?]]

p. 4: "We cannot claim, however, that CBR is the only way people learn.

- P. 6: "As we mentioned, an expert must have many experiences in his domain of expertise. This collection of experiences becomes the mental case library from which he will retrieve important memories to help him solve new problems."
- Indexing Experts must be able to organize their experiences such that they know where they can find relevant information when needed.
- Goals, Plans and Expectations (p. 8)
- Expectation Failure
- Explanations

- GBSs ("goal-based scenarios") structure for teaching and learning
  - Learn-by-doing simulations
  - Just in time coaching
  - Software or live role-plays
  - Pp. 12+: "There are seven essential components of GBS: the *learning goals*, the *mission*, the *cover story*, the *role*, the *scenario operations*, *resources*, and *feedback*, including coaches, and experts.
  - P. 21: "The course design process contained five steps, similar to those for a computer-based GBS. The first was to define the learning goals to be taught in the course. ... Second, we search for a prototypical real-world case ... third step, we analyzed the case for those issues that arose in reality which would require our students to use the target knowledge and skills. ... The fourth step ... was to establish which activities we would require our trainees to do so that they would encounter the target knowledge and skills. ... [[Fifth???]] a communications coach was there to give them feedback on what they did well, and in which areas they could improve

- p. 1: "We present GBSs as the ideal method of instruction, appropriate for any subject and any age student, whether for school or for business" (p. 1)
- p. 4: "We cannot claim, however, that CBR is the only way people learn.
- <u>GES's Observations, etc.:</u>
  - OK but applicable to all aspects of learning?
  - Do we perhaps have need for "in vitro, in viva" learning distinctions?

- **Although demonstration of procedural knowledge may reflect learning of declarative knowledge, will "procedural knowledge learning" of the type suggested here facilitate, or even enable, "declarative knowledge learning"?**
- **Do novices "notice" aspects as competently as do experts when learning in this type environment?**
- **Where/how do novices learn concepts and principles?**

<u>Presentation #2, Session #1</u>

Chapter 13 Katerine Bielaczyc & Allan Collins, Learning Communities in Classrooms: A Reconceptualization of Educational Practice

- **P. 1: "In a learning community the goal is to advance the collective knowledge and in that way to support the growth of individual knowledge (Scardamalia & Bereiter, 1994)."**
- **P. 1: "The defining quality of a learning community is that there is a culture of learning , where everyone is pursuing and discussing ideas. There are three characteristics that such a culture must have: (1) an identity as a community, (2) collective knowledge and skills, and (3) sharing of learning with others." ... ... "A learning community only emerges when there is a climate of sharing and discussion of ideas and techniques."**
- **GES phrasing: "Why" learning communities? At least three arguments as to why it would be good to do so**
  - ***Social-constructivist argument***
  - ***Learning-to-learn argument***
  - ***Multi-cultural argument***

- **GES 'summary' – "On the basis of an analysis of three cases "In considering these different cases, we have tried to encapsulate what we have learned from them into a set of principles for the design of effective learning communities.**
  - **Community-Growth Principle**
  - **Emergent-Goals Principle**
  - **Articulation-of-Goals Principle**
  - **Metacognitive Principle**
  - **Beyond-the-Bounds Principle**
  - **Respect-for-Others Principle**
  - **Failure-Safe Principle**
  - **Structural-Dependence Principle**
  - **Depth-over-Breadth Principle**
  - **Diverse-Expertise Principle**

- **Multiple-Ways-to Participate Principle**
- **Sharing Principle**
- **Negotiation Principle**
- **Quality-of-Products Principle**

GES's Observations, etc.:

Helpful to have some principles guiding development of learning communities

Given the growing interest in the Internet, one question that comes to mind is: To what extent might these "face-to-face" principles also apply to cyberspace learning communities. It does not seem unreasonable to expect that such communities will develop ... even to posit that some already have been forming

In cyber groups will additional goals be identified, as these authors suggest has happened with face-to-face groups?

Presentation #3, Session #1

Chapter 14 Lyn Corno & Judy Randi, A Design Theory for Classroom Instruction in Self-Regulated Learning?

P. 1, first paragraph: "Our title is intended to *call into question* (italics added) the appropriateness of design theory for classroom instruction in self-regulated learning. Although more than a decade of research has stressed that self-regulation in schoolwork can be promoted through explicit teaching, our own work has led us to the position that the very goals involved in pursuit of self-regulated learning in students may be undermined by the kind of specification necessary for a good design theory of classroom instruction. Our contribution here may thus be somewhat controversial, but our position is not inconsistent with the new paradigm for instructional theory Reigeluth described in Chapter 1."

GES's observation: The authors' first paragraph in this paper immediately grabbed my attention., not only because it could be viewed as controversial regarding instructional theory but also because I do not believe that it should be controversial.

- "Beauty" ... Need delineation and specification of what is "beautiful" necessarily 'destroy' our images?
- Does the mere fact that we're able to understand something, almost anything, mean that some important quality may be 'lost' if/when we try to use such knowledge to create or to modify or to design that thing or attribute?
- Suppose that we admire the work of a very creative architect and would like to know how we could likewise produce more

interesting, creative designs ourselves. Would studying the features and principles of creative architects' work, and then using that knowledge to help novices to learn how to produce creative designs themselves lead to degradation or destruction of resultant images even as we come to understand what makes them so striking to us? Although that is a possible outcome, I suspect that it is not necessarily going to occur.

- Moreover, I believe that the question(s) posed by these authors may be applicable to design processes in general, not only those involving self-regulated learning.
- I suspect that 'real artistry in design' – not only with regard to self-regulated learning – may include 'not leaving fingerprints' about the way and manner in which we designed that something. It also may mean that we must 'go beyond' the principles that have been articulated in those instances where we are trying to apply these creative ideas.

- **GES's Observations, etc.:**
- **Some very good "ideas" from this theory about facilitating self-regulated learning.**
- **But the "controversial" matter they address, I believe, is both not so controversial as they seem to indicate and, perhaps even more importantly, is relevant to all of us involved with instructional theory (and, for that matter, with most if not all theories).**
- **Whenever and wherever we use theories (any theories) to design instruction, they can be misused and misunderstand in various ways. In a sense, it's tough to live without theories, but it's also easy to permit our theories to distort rather than to help us.**
- **We need theories to help us think about and recognize phenomena, but we also need to recognize that there are problems in developing any theories. Other people may take them literally and use them rigidly, no matter what we may say.**
- **In a search to find "mental tools" to aid us as researchers or as practitioners, it is very easy to treat a theory as something definite rather than as only our best, current approximation of reality.**
- **While we need to teach novices ways in which theories can guide their efforts, we also need to teach them that theories need to be adapted and modified to some extent.**

- **Presentation #4, Session #1**

Chapter 12 Laurie Miller Nelson, Collaborative Group Problem Solving: Learning Together (Collaborative Problem Solving)

Author combines "cooperative learning" with "problem-based learning environment"

This leads to a combination of these two approaches along with "additional guidelines on how to support learners through the actual problem-solving phase. – CPS (Collaborative Problems Solving) theory

She offers both some "comprehensive guidelines" which "underlie and are applied throughout the entire process" (p. 3) and "process activities" that are limited to specific phases of the problem-solving process."

GES's Observations, etc.:

A set of ideas from this theory —

GES: This results in a well-organized set of ideas about facilitating group engagement in problem-solving activities, including suggestions about processes involved and guidelines about when and how to use the CPS theory

GES: One "issue involves questions about how we can provide more individualized instruction and (formative?) evaluations at the individual student level. As I've noted earlier, this is not an issue that solely involves this particular theory but it is one with which we all must be concerned from time to time.

Presentation #5, Session #1

Chapter 24 Thomas F. Kamradt & Elizabeth J. Kamradt, Structured Design for Attitudinal Instruction

p. 1: "In our travels across the corporate landscape, the authors have found the word *Attitude* emblazoned on the following items: ..... "

..... But the use of *"Attitude!"* as a pop icon also reveals a serious problem, namely:

o When we sing the praises of attitude as a performance goal, we know exactly what we mean.

o When we try to actually do something to affect attitude, our efforts are often misguided and fruitless."

p1: "..... Our goal in the development of this model has been twofold:

o Retain the rigor that accounts for the strength and success of contemporary instructional design techniques, namely, repeatable methods leading to predictable results.

o Disseminate the skills required for effective attitudinal instruction to a wide audience of educators and designers who have not found success, or perhaps have not attempted to succeed, in this area."

GES's Observations, etc.:

Some "ideas" from Kamradt and Kamradt

On more occasions than I like to count, I've heard both teachers and trainers say that too many of their students/clients "have an attitude." It's almost as though "having an attitude" almost automatically means that "attitudes" are necessarily bad.

In some respects, Kamradt and Kamradt present "having an attitude" as a natural aspect of instruction ... an aspect that we should not merely "tolerate" but foster as a means of supporting instructional processes and outcomes. Instead of viewing "attitudes" as separate from instruction and learning, these authors view attitudes as an integral facet of learning and instruction.

Some "issues" from Kamradt and Kamradt that are relevant for instructional theory more generally.

When and how should we acknowledge that "attitudes" are sufficiently important as outcomes that we may (a) identify attitudinal change or development as an explicit goal, (b) designate instructional strategies to change or develop attitudes, and (c) "count" attitudinal change or development as a major basis on which to evaluate learners' "achievement" and program's effectivness?